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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,106	12/11/2001	Laurence W. Davies	26998-241146	6824

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EXAMINER

TORRES VELAZQUEZ, NORCA LIZ

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/015,106

Applicant(s)

DAVIES ET AL.

Examiner

Norca L. Torres-Velazquez

Art Unit

1771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-76 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-76 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4/26/02
5/11/03
2/27/03
4/24/03
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claim 55 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 55 recites the limitation "the permeably reinforcing sheet" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-9, 13-15, 26-27, 30-31, 37, 54, 59-62, 64-65, 67-68, 72 and 74 are rejected under 35 U.S.C. 102(b) as being anticipated by HARAGUCHI et al. (US 5,286,553).

HARAGUCHI et al. discloses a composite sheet for a reinforcing material that has excellent moldability and processability. (Column 1, lines 12-18) The reference teaches the use of a bundle of reinforcing filaments that are gathered and unidirectionally paralleled in each of the web-constituting reinforcing filament bundles and the filaments are not entangled with one another. A web having bundles of reinforcing filaments gathered and unidirectionally paralleled are preferably used, because the strength and rigidity can be effectively *imparted in the necessary direction in the molded article* (Column 4, lines 23-37). Therefore, the use of reinforcing filaments extending in a particular direction (such as a transverse direction) is dependent upon the strength and rigidity needs of the molded article. Reinforcing filaments are

Art Unit: 1771

substantially continuous fibers, for example, a carbon fiber, a glass fiber, an aramid fiber, a silicon carbide fiber, a polybenzothiazole fiber. The reference also teaches that even a thermoplastic polymer filament can be used as the reinforcing filament if the fiber is not substantially melted at the step of heat-melting the thermoplastic polymer fiber and exerts a reinforcing function after cooling and solidification. With regards to the claimed treatment on claim 32, the reference also teaches that to facilitate the impregnation with a melt of the thermoplastic polymer fiber at the heat-melting step for forming a composite, preferably the surfaces of single filaments of the reinforcing filament bundle are coated with a thermoplastic polymer so that the softness is not lost. (Column 4, lines 57-60 and Column 5, lines 3-22). The amount of the reinforcing filament bundle in the composite sheet is 5 to 80% by volume based on the composite sheet. Among the thermoplastic polymer fiber material used is polyester. (Column 5, lines 44-65) The thermoplastic polymer may be in the form of an alloy, and two or more thermoplastic polymer fiber can be used. (Column 6, lines 1-3) The reference teaches the use of thermoplastic polymer staple fibers having a length no longer than 100 cm [39 inches], preferably no longer than 10 cm [3.9 inches]. (Column 7, lines 7-9) With regards to claims 6 and 7, the reference teaches the use of a staple fiber sheet having a basis weight of 64 g/m².

HARAGUCHI et al. further teaches the use of a process in which a thermoplastic polymer staple fiber or filament is deposited or incorporated in the form of single filaments on or in a web containing a reinforcing filament bundle, and a jet of fluid is applied to the assembly to intrude the thermoplastic polymer fiber into the reinforcing filament bundle and entangle and integrate the thermoplastic polymer fiber with the filaments. (Column 8, lines 23-32)

In a preferred embodiment of the HARAGUCHI et al.'s invention, reinforcing filament bundles are unidirectionally paralleled to form a web, and this web is laminated on the thermoplastic staple fiber web. Then the laminate of the thermoplastic staple fiber or filament sheet and the reinforcing filament bundle is subjected to a mechanical process by a jet stream of a fluid. More specifically, at least two sheets of the thermoplastic fibers and at least two webs of the reinforcing filament bundles are laminated (laminated is sometimes carried out by changing the arranging direction of the reinforcing fiber or using different kinds of reinforcing fibers), and the jet stream of a fluid is made to pierce through the laminate in the direction orthogonal to the plane of the sheet, whereby the thermoplastic fiber is embedded in the reinforcing filament bundle web and is entangled and integrated with individual filaments of the reinforcing filament bundle to obtain the intended composite sheet. (Column 8, lines 36-68)

Claim Rejections - 35 USC § 102/103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 21-25, 28-29, 50-53, 56 and 66 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over HARAGUCHI et al. as disclosed above.

Although HARAGUCHI et al. does not explicitly teach the claimed tensile strength, bending resistance of fiber and ratio of a modulus of elasticity it is reasonable to presume that these properties are inherent to reinforcing material of HARAGUCHI et al. Support for said

Art Unit: 1771

presumption is found in the use of like materials (i.e. unidirectionally paralleled reinforcement filaments, thermoplastic polymer fibers and entangling process). The burden is upon Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed property of ratio of modulus elasticity would obviously have been present one the HARAGUCHI et al. product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection made above under 35 USC 102.

Ex parte Slob, 157 USPQ 172, states the following with regard to an article claimed by defining property values:

Claims merely setting forth physical characteristics desired in article, and not setting forth specific compositions which would meet such characteristics, are invalid as vague, indefinite, and functional since they cover any conceivable combination of ingredients either presently existing or which might be discovered in future and which would impart desired characteristics; thus expression "a liquefiable substance having a liquefaction temperature from about 40°C. to about 300°C. and being compatible with the ingredients in the powdered detergent composition" is too broad and indefinite since it purports to cover everything which will perform the desired functions regardless of its composition, and, in effect, recites compounds by what it is desired that they do rather than what they are; expression also is too broad since it appears to read upon materials that could not possibly be used to accomplish purposes intended.

Thus, claims 21-25, 28-29, 50-53, 56 and 66 are indefinite for reciting only the desired physical properties of the reinforcing structure, rather than setting forth structural and/or chemical characteristics of said reinforcing structure.

Claim Rejections - 35 USC § 103

7. Claims 11-12 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et al. as applied to claims 1-9, 13-15, 26-27, 30-31, 37, 54, 59-62, 64-65, 67-68, 72 and 74 above, and further in view of MARTIN et al. (US 6,080,482).

While HARAGUCHI et al. teaches that the thermoplastic polymer of the polymeric fibers may be in the form of an alloy, and two or more thermoplastic polymer fiber can be used.

Art Unit: 1771

(Column 6, lines 1-3), it fails to teach the use of bi-component fibers with core-sheath configuration.

MARTIN et al. teaches multicomponent filaments that may be fabricated into filamentary articles or structures or three-dimensional aggregations comprising a plurality of the filaments, which can be in either continuous or staple form. Further, the reference teaches the use of these filaments as reinforcement for plastic matrices. (Column 6, lines 25-67 through Column 7, lines 1-4). In Figures 7-14, the reference shows different configurations of core-sheath fibers. Since both HARAGUCHI et al. and MARTIN et al. are directed to the use of staple fibers as reinforcement, the purpose disclosed by MARTIN et al. would have been recognized in the pertinent art of HARAGUICH et al.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the polymeric staple fiber layer and provide with a bicomponent fiber with the motivation of providing the reinforcement material with a web layer that is durable without requiring the application of binding agent, or adhesive coating, or solvent and that can be used for article fabrication once the webs are melt-bonded as disclosed by MARTIN et al. (Column 6, lines 14-18).

8. Claims 18-19 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et al. as applied to claims 1-9, 13-15, 26-27, 30-31, 37, 54, 59-62, 64-65, 67-68, 72 and 74 above, and further in view of SHANNON (US 4,278,720).

HARAGUCHI et al. fails to teach the use of a binder to attach the permeable transportweb to the first reinforcing fibers.

SHANNON discloses a bonded mat that includes directionally oriented strands held together by swirled strands or randomly oriented fibers, and all of which are permanently held together by a binder. (Abstract and refer to Example 1)

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the reinforcement material and provide with a binder with the motivation bonding the strands with an organic binder which softens or sometimes dissolves to some degree in later applied organic impregnating resin; so that the strands become unbonded to allow the mat to stretch over projections during the molding as disclosed by SHANNON. (Column 1, lines 10-17). With regards to claim 19, it is noted that the use of binders, such as polyvinyl acetate, are known to be used in the art of reinforcement material. For example, the prior art RADVAN et al. (US 4,882,114), teaches a fiber reinforced material and teaches the use of polyvinyl acetate as a binder. (Refer to claims)

9. Claims 16-17, 34-36, 38-49, 57-58, 69-71 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et al. as applied to claims 1-9, 13-15, 26-27, 30-31, 37, 54, 59-62, 64-65, 67-68, 72 and 74 above, and further in view of VANE (US 5,055,242).

HARAGUCHI et al. fails to teach the use of stitching.

VANE discloses a reinforcing material having a plurality of superimposed layers, each layer consisting of a plurality of unidirectional non-woven yarns or threads laid side-by-side, the yarns or threads in at least some of the different layers extending in different directions, the layers are stitched together. (Column 2, lines 14-21). The reference further discloses that the yarns or threads in at least two of the layers are laid so that they extend at 90° to one another. The yarns or threads in at least one further layer are laid so that they extend at an angle of from

Art Unit: 1771

45° to 90° with respect to the yarns or threads in at least one the two layers. (Column 2, lines 26-42). The yarns or threads used to produce the reinforcing material may be yarns, threads, roving, tows or the like, of continuous or discontinuous fibers, of glass fiber or other suitable reinforcing material. The yarn or thread used for stitching together the layers may itself be a reinforcing material or a thermoplastic or other material. (Column 2, line 58 through Column 3, lines 1-2) Further, the reference teaches the use of at least one sheet of thermoplastic material interposed between at least two of the reinforcing material layers. (Column 3, lines 20-21)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the reinforcing material and provide it with a stitching to hold the fibers with the motivation of overcoming some of the disadvantages of the prior art, such as by mixing the reinforcing fibers with synthetic material that produces resin-rich and reinforcing fiber-rich areas whereby the quality and mechanical properties of the article can be unpredictable as disclosed by BEER. (Column 1, lines 10-68).

10. Claims 20-25, 32-33 and 75-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et al. as applied to claims 1-9, 13-15, 26-27, 30-31, 37, 54, 59-62, 64-65, 67-68, 72 and 74 above, and further in view of BEER et al. (US 5,910,458).

HARAGUCHI et al. fails to teach perforations or holes in the reinforcing structure, it also fails to teach the use of a surface treatment on the fibers.

BEER et al. discloses a mat adapted to reinforce a thermosetting matrix material, the mat comprises a primary layer comprising a plurality of generally parallel, essentially continuous glass fiber strands oriented generally parallel to a longitudinal axis of the mat; and a secondary layer positioned adjacent to a surface of the primary layer that comprises a plurality of randomly

Art Unit: 1771

oriented, generally continuous glass fiber strands. The reference further teaches that the strands of the primary layer are entangled with the strands of the secondary layer by needling together at least a portion of the strands of the primary layer and the strands secondary layer to form a mat. (Column 2, lines 16-45) The reference further teaches that the secondary layer comprises a plurality of randomly oriented glass fiber strands, which comprised generally continuous glass fiber strands and/or discontinuous or chopped glass fiber strands. (Column 14, lines 7-10)

BEER et al. uses needling to entangle the layers of their mat. Since the claimed permeability is produced by treating the mat by hydro-entanglement or by needling, this property would have been an expected result of the needling process taught by BEER et al.

Further, on Table I of BEER et al. a sizing composition is disclosed for the mat fiber that includes gamma-aminopropyltriethoxysilane.

Since both HARAGUCHI et al. and BEER et al. are directed to reinforcement materials, the purpose disclosed by BEER et al. would have been recognized in the pertinent art of HARAGUCHI et al.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the reinforcement material and provide with a coating or sizing treatment with the motivation of providing it with a good "wet-through" and "wet-out" properties as disclosed by BEER et al. (Column 1, lines 29-39).

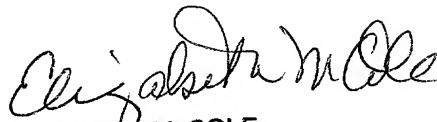
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Norca L. Torres-Velazquez whose telephone number is 703-306-5714. The examiner can normally be reached on Monday-Thursday 8:00-4:00 pm.

Art Unit: 1771

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 703-308-2414. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

NLT
August 8, 2003


ELIZABETH M. COLE
PRIMARY EXAMINER